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THE FRUIT INSECT SITUATION, 1931.

A radio talk by B. A. Porter, Bureau of Entomology, delivered through WRC and 40 other radio stations associated with the National Broadcasting Company, April 2, 1931.

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The necessity for controlling insect pests injurious to orchards is important among the factors which have caused the production of quality fruit to become a highly specialized business. The details of the solution of each problem must be worked out by the grower himself, although the various Federal and State agencies can be of great assistance. Each orchard presents its own peculiar problems. Even within the same orchard the grower may have a wide variety of conditions to meet, and the control program found satisfactory in one portion of the orchard, or on one variety of fruit, may prove entirely unsatisfactory in another part of the orchard, or on a different variety of fruit. For instance, in the southern part of the Middle West the spray program followed on a block of Dutchess apple trees is almost totally unlike that followed on Winesap or Ben Davis. In all insect control programs, the grower must supplement the general recommendations with a liberal quantity of common sense, and must be keenly observant of all that is going on in his own orchard.

The Deciduous Fruit Insect Division, of the Bureau of Entomology of the U. S. Department of Agriculture, is a research organization devoting the major portion of its attention to working out the fundamental principles underlying the control of fruit pests. On the basis of the information thus obtained, the Department is able to outline in a general way the control programs likely to prove most satisfactory under average conditions. In working out the details of his individual problems, however, the grower should also avail himself of the services of his local county agent and of his State University and Experiment Station, since these agencies are in much closer touch with the specific needs of your particular locality. Even the recommendations received from these sources must often be modified to adapt them to the individual orchard concerned.

Only a few of the more serious insect pests which require attention in orchards can be mentioned at this time. The spray program divides itself naturally into two main portions; the control of insects during the dormant period, and the control of insects during the growing period. During the dormant period much stronger sprays can be applied, and certain insects, especially the San Jose scale, can be best controlled by spraying during the late fall or early spring, while there are no leaves on the trees.

The San Jose scale is familiar to all fruit growers. The information about this insect is summarized in Farmers' Bulletin No. 650, which you may obtain on application to the U. S. Department of Agriculture. Either lime sulphur, as emphasized in this bulletin, or the oil sprays, which have come into extensive use in recent years, may be used in the control of the San Jose

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scale. The preparation of some of the more common oil sprays is discussed in Mimeographed Circular No. E-282, which may be obtained from the Bureau of Entomology here in Washington.

Of course in latitudes south of Virginia and south of the Ohio Valley the dormant sprays for this insect have already been applied and the growing season is already under way. In the Shenandoah Valley these applications are, or should be, mostly completed. At points farther north dormant spraying will be in progress for the next month or so, depending on the exact locality.

In some parts of the country the European red mite also requires treatment. This mite is not an insect at all, although it is very closely related to the insects. It winters on the bark of the trees in the form of very tiny red eggs and may be best controlled by the use of an oil-emulsion spray at 3 per cent to 4 per cent or more of actual oil.

In many orchards the apple aphids are also controlled at this time of the year. These apple aphids, as most of you probably know, winter over in the form of tiny black eggs on the twigs and smaller branches of the apple trees. With the first warm days of spring these eggs hatch and the young aphids cluster on the swelling apple buds. At this time they are easy to hit with the spray and may be effectively controlled by the use of dormant strength lime sulphur as used for the San Jose scale with the addition of nicotine sulphate. An application made at this time is referred to as the "delayed dormant spray." It should be completed before the leaves have pushed out more than a half inch. The oil sprays, which are preferable wherever the European red mite is a serious factor, are not entirely dependable in the control of apple aphids, although with the addition of nicotine sulphate fairly satisfactory results have been obtained.

Now for brief mention of the control of apple insects during the growing season. In many localities the growers say they spray only once during the growing season, that is, they start when the buds show pink and continue spraying until the fruit is nearly ripe. In other words, they spray all of the time during the growing season. In practically all localities 4 or 5 spray applications are needed in the course of the season, although in more northern regions it is occasionally possible to produce good fruit with a smaller number of sprays.

The most serious apple insect to be controlled in practically all orchards is the codling moth, or apple worm. The most important single spray application for the control of this insect is known as the calyx spray because this is applied just after the petals have fallen, and the object of this application is to place a quantity of lead arsenate in the calyx cup, or blossom end, of the tiny apple. While no worms are present at this time, the majority of the first brood and a great many of the later broods attempt to enter the fruit at this point. The poison must be placed in the calyx cup before the tiny calyx lobes close over.

The calyx spray is followed by a series of applications usually referred to as cover sprays, the number varying according to the locality. In northern localities 1 or 2 cover sprays are often sufficient. In more southern localities, as already indicated, sometimes 6 or 7 cover sprays are applied. The exact timing of these depends upon the development of the codling moth. More exact information as to the time of the appearance of the moths and the probable time of hatching of the worms may be obtained from your County Agent, from the Extension Service of your State College or University, or from your State Experiment Station. They will also advise you as to the number of applications needed.

Another apple pest of importance in the northeastern States in particular is the plum curculio, which is also a serious pest of peach and other fruits. In orchards which are surrounded by brush land or which are not cultivated, the curculio has proved a serious problem. The adult curculio beetles begin to appear in the orchard about the time the apples bloom, and most of their eggs are laid during the month following petal-fall. For the control of severe infestations one or two heavy applications of lead arsenate are made during this period. You can get more detailed advice concerning the control of this insect from your local authorities.

There are a great many other insects which often attack the apple. Information about a number of them will be found in Farmers' Bulletin No. 908.

Now for a word as to the control of insects affecting peaches. The most important peach pest controllable by spraying is the plum curculio, which has already been mentioned as a pest of apple. In peach orchards, however, the control of this insect is a different problem, chiefly because peach foliage is very sensitive to arsenic. The peach schedule followed in southern peach orchards is different from that followed by peach growers in more northern localities.

The spray schedule in most common use in the South will be found in Farmers' Bulletin No. 1557, which may be obtained by addressing the U. S. Department of Agriculture at Washington, D. C. The southern peach spray schedule is also available as Mimeographed Circular No. E-270, Revised, which may be obtained by addressing the Bureau of Entomology, Washington, D. C., or the Peach Insect Laboratory at Fort Valley, Georgia.

For more northern peach orchards the spray schedule is somewhat different. Farmers' Bulletin No. 908, which has already been mentioned, outlines the spray schedule for use in northern orchards.

In addition to being injured by the plum curculio, peaches often suffer considerable injury from the oriental fruit moth. This is a serious problem and we are obliged to admit that we are not yet in position to recommend satisfactory control measures.

Another serious pest of the peach which is controllable by measures other than spraying, is the peach tree borer. This insect is discussed in Farmers' Bulletin No. 1246, which also describes the paradichlorobenzene

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treatment which has been found very effective in the control of this pest. The paradichlorobenzene treatment is also described in Farmers' Bulletin No. 1557, already mentioned. This treatment for the peach tree borer is most satisfactory when applied in the late fall and will be discussed for you at some later date.

There is not time for discussion of the control of grape insects. The most important problems are the control of the grape berry moth and of the grape leafhoppers. You will find these discussed in Farmers' Bulletin 1220, which may also be obtained upon application to the U. S. Department of Agriculture.

Information on the control of insects affecting other fruits which have not been mentioned will be found in Farmers' Bulletin No. 908, which you have already made note of.